

Questions and Answers #1 for Solicitation #NNC11359052R – Stitching and Weaving of Ceramic Materials

Referencing Section C (The Statement of Work):

- 1. “Does NASA have specific weave designs in mind for the 8HS (1.5D), 8HS (Double) and 8HS (2.5D) constructions in Table 1? Can the design(s) be provided to us to ensure the accuracy of our quote?”

NASA DOES HAVE SPECIFIC WEAVE DESIGNS IN MIND:



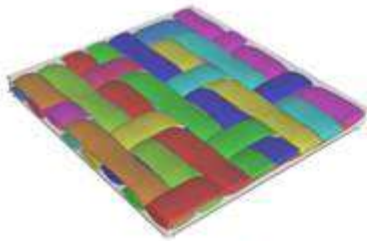
8	X	X		X	X	X		X
7		X		X		X		X
6		X	X	X		X	X	X
5			X	X				X
4	X		X	X	X			X
3	X		X		X			X
2	X	X	X		X	X	X	
1	X	X			X	X		
	1	2	3	4	5	6	7	8

In the 8HS 1.5, each yarn floats over 5 others

8HS 1.5D

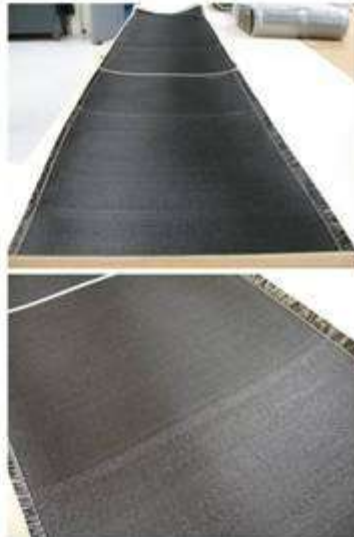


8HS - 1.5 26x30 (4ft)
8HS - 1.5 26x34 (3ft)



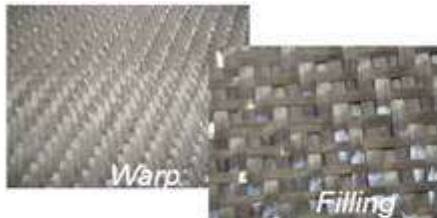
8HS Double Satin

8					X	X	
7			X	X			
6	X						X
5					X	X	
4		X	X				
3							X
2				X	X		
1	X	X					
	1	2	3	4	5	6	7



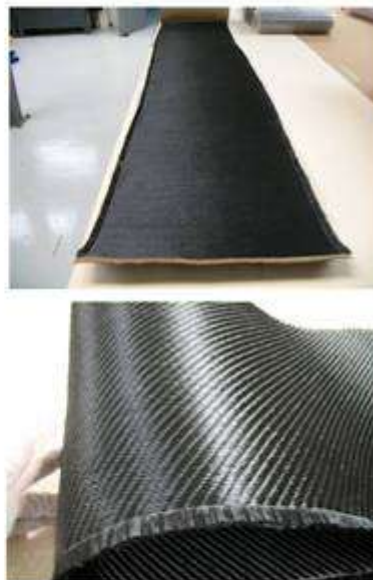
In the 8HS-Double Satin, the X indicates an additional warp crossover which reduces the 7 yarn float to 4 and 2

8HS - double 26x30 (4ft)
8HS - double 26x34 (3ft)



12 HS 2.5D

16					X							
15				X	X	X	X	X	X	X	X	X
14								X				
13	X				X	X	X	X	X	X	X	X
12								X				
11		X			X	X	X	X	X	X	X	X
10								X				
9			X		X	X	X	X	X	X	X	X
8								X				
7				X	X		X	X	X	X	X	X
6								X				
5	X				X	X	X	X	X	X	X	X
4								X				
3		X			X	X	X	X	X	X	X	X
2								X				
1			X			X	X	X	X	X	X	X
	1	2	3	4	5	6	7	8	9	10	11	12



The 12HS Doublecloth is constructed from 2-6 harness fabrics that are loosely attached with existing warp yarns.

Maximum float length is 7 yarns in length

12HS - 2.5 6.5ft

2. “Do the Warp EPI and Fill PPI values in Table 1 correspond to a specific fiber chemistry and/or denier? (For example perhaps 1600 denier fiber is to be used for all fabrics (Nextel, Hi Nicalon, Sylramic, etc.?) and perhaps the end counts are the same for all fabrics?)”

WARP EPI AND FILL EPI WOULD VARY WITH SPECIFIC FIBER AND TOW SIZE. THE EXAMPLE BELOW ASSUMES 1800 DENIER NICAL ON TOW, BUT THE OFFERER SHOULD BE CAPABLE OF PROVIDING SIMILAR VARIATION IN EPI WITH OTHER FIBER TYPES.

	Ends/in x Ends/in
5 Harness Satin	26 x 26
8 Harness Satin	30 x 26
8 Harness Satin	26 x 34
8 Harness Satin (1.5 layer)	26 x 30
8 Harness Satin (1.5 layer)	26 x 34
8 Harness Satin (double cloth)	26 x 30
8 Harness Satin (double cloth)	26 x 34
12 Harness Satin (2.5 d)	40 x 40

3. “Is there a target width or range of widths for the fabrics to be supplied in Table 1? (Note that fabric costs are dependent on width and do not necessary scale proportionally so a range of widths likely to be desired by NASA will be helpful in order provide accurate costs)”

WIDTH AND LENGTH WILL BE SPECIFIED AT A LATER DATE TO CORRESPOND WITH TESTING REQUIREMENTS. A MINIMUM WIDTH WOULD BE 12 INCHES; BUT THE OFFEROR UST BE CAPABLE OF WEAVING 24 INCH WIDE FABRIC. THE ASSUMED MAXIMUM WIDTH WOULD NOT EXCEED 6 FEET.

4. “In Area 2 (Stitching), what chemistry of ceramic stitching fiber would be acceptable? (Nextel 312, for example, would work well here (from a process perspective), while Sylramic would work poorly.) Additionally, can NASA provide a rough estimate of the density of stitch sites required?”

STITCHING YARN COULD BE BOTH REFRACTORY OXIDE OR NON-OXIDE FIBER, INCLUDING NEXTEL EG – BT-30, OR NICALON, OR TYRRANO). NEXTEL 312 WILL NOT BE A FIRST CHOICE, NEITHER WOULD SYLRAMIC; IT IS EXPECTED THAT THE STITCHING CONTRACTOR WOULD BE ABLE TO ACCOMMODATE A VARIETY OF THREADS SPECIFIED BY THE GOVERNMENT.

STITCH DENSITY WILL VARY WITH THE LAYER TYPES TO BE JOINED BY STITCHING. STITCH DENSITY WILL BE SPECIFIED WITH EACH TASK ORDER, AND MAY CHANGE TO ACCOMMODATE DIFFERENT STITCH DENSITIES.

5. “Is there a specific stitching method that NASA prefers or are we able to recommend a suitable stitching method(s)?”

THIS IS EXPECTED TO BE IN PART A DEVELOPMENT EFFORT; GOVERNMENT WOULD BE OPEN TO RECOMMENDATIONS, BUT WOULD ULTIMATELY SPECIFY A FINAL METHOD (WOULD WORK WITH THE CONTRACTOR AS NECESSARY).

6. “In Area 3, can NASA advise what Saffil grade is to be used (i.e. will this be a "vacuum formable" Saffil fiber with binders pre-applied by the fiber manufacturer?)”

THIS IS A DEVELOPMENTAL EFFORT AND WOULD BE OPEN TO VENDOR INPUT. SEVERAL SMALL TRIALS MIGHT BE REQUIRED TO SELECT A PREFERRED APPROACH.

7. “I have sewn fire blankets for NRC appendix R channel separation. Your reference to 5.06” in the solicitation suggests there may be a Tolerance far more precise than I can imagine for a stitching process. Are these items to be hand/machine sewn?”

THE 5.08 CM IS A PREFORM SIZE AND CORRESPONDS WITH A 2 INCH DIAMETER—THE TWO DECIMAL PLACES IS THE RESULT OF CONVERSION FROM INCHES TO CM.

8. “Do you have a spec on Overlap fold? and edge-finished edge? And stitch lengths?”

WE DO NOT MENTION OVERLAP FOLDS OR EDGE FINISH IN THE SOW.
WE DO NOT HAVE A SPEC FOR STITCH LENGTH, WHICH MAY VARY
WITH THE CONSITUENT LAYERS AND MATERIAL TYPES.

9. “Is quartz Thread to be used?”

THE THREAD IS NEXTEL OR NICALON, DEPENDING UPON THE
CERAMIC FABRIC USED.

10. “Are you’ all supplying all materials?”

YES

11. “Are we to stuff The filler and hand sew the covering closed?”

NO--

THE STITCHED PACKAGES ARE COMPRISED OF LAYERS OF CERAMIC
FABRIC, AEROGEL FILMS, OR AEROGEL-IMPREGNATED FELTS OR
BLANKETS, AND KAPTON

12. “What general order of size are these pieces to be?”

ANTICIPATED SAMPLE SIZES ARE 15.24 X 15.24 CM AND 30.48 X 30.48
CM.